

## DESIGN CRITERIA APPLICABLE TO ACTIVITIES UNDER ALTERNATIVE B

Forest Plan standards and guidelines, Regional Watershed Conservation Practices (WCPs, Forest Service Handbook 2509.25), South Dakota Best Management Practices and other management requirements apply to the proposed activities. Other management requirements such as applicable Forest Plan standards are repeated here only if clarification is required. An ArcGIS shapefile containing design criteria information is located in the West Rim project file.

Applies To:	Measure
All Activities	<p>Brush Disposal:</p> <ul style="list-style-type: none"> <li>Disposal of slash piles created through timber harvest or fuel treatments would be funded appropriately. Rehabilitation of pile sites would include site preparation and seeding to return the sites to productivity and control the spread of noxious weeds.</li> </ul>
All Activities	<p>Heritage Resources:</p> <ul style="list-style-type: none"> <li>All culturally sensitive areas, Traditional Cultural Properties, potential graves and sites eligible or potentially eligible to the National Register of Historic Places would be avoided under proposed activities with a 100-foot buffer. Other mitigation identified in the project file for each property would be required during implementation of the project. Heritage site locations and specific mitigations are outlined in the National Historic Preservation Act, Section 106 compliance reports (Kinsman 2007). Heritage site locations are not identified in this EIS to protect site integrity.</li> <li>In the event that culturally sensitive areas, Traditional Cultural Properties, potential graves, or sites eligible or potentially eligible to the National Register of Historic Places cannot be avoided, or new heritage resources are found during implementation of the project, the District Project Staff will stop all activity in the affected area and notify the District Archeologist. Appropriate consultation with the State Historic Preservation Office, Tribal Historic Preservation Offices, Native American Tribes, American Indians, and other applicable parties would take place as directed by Section 106 of the National Historic Preservation Act.</li> <li>Leaders of project activities described in this EIS would review the heritage report and geospatial data for areas to protect and specific mitigations. Project leaders should then contact district heritage staff for additional assistance in marking the sites for protection on the ground.</li> </ul>
All Activities	<p>Improvements:</p> <ul style="list-style-type: none"> <li>All Forest Service-authorized improvements, such as fences and water developments, would be shown as protected improvements on timber sale area maps and protected during management activities.</li> <li>Protect all documented NFS land boundary corners, posts, and bearing trees.</li> <li>Provide access routes as needed for utility line construction, reconstruction, and maintenance of existing right-of-way corridors.</li> <li>Avoid or protect utility infrastructure in project area during project implementation.</li> <li>Avoid or protect improvements under special use permit.</li> <li>Protect all mining corner posts and active mining claim developments.</li> <li>To mitigate the effects immediately adjacent to recreation residence cabins, the special uses staff would assist in marking trees and notifying permit holders of management activities.</li> </ul>

Applies To:	Measure
All Activities	<p>Meadows:</p> <ul style="list-style-type: none"><li>• White spruce will not be removed from wet meadows unless they are considered a safety hazard.</li><li>• Surface disturbing activities (i.e., skid trails, landings, temporary roads, etc.) will be avoided as much as possible in meadows.</li><li>• Surface disturbing activities activities (i.e., skid trails, landings, temporary roads, etc.) in meadows that were not identified during project planning will be evaluated by a district wildlife biologist and botanist prior to implementation to determine if special requirements are warranted to protect site integrity.</li></ul>
All Activities	<p>Noxious Weeds:</p> <ul style="list-style-type: none"><li>• Contracts and permits issued as part of this project would include measures to limit spread of noxious weeds. Known weed infestations will be displayed on the timber sale map. Off-road equipment associated with the activity would be washed before entering the site to prevent spread of weeds to adjacent NFS and private lands.</li><li>• Where ground-disturbing activities would occur in areas infested with weeds, weeds would be treated before project implementation, when feasible, to reduce future spread and establishment of noxious weeds.</li><li>• Review of the area for noxious weed infestations would continue during management activities. If new noxious weed infestations that could be spread by management activities are found during implementation, actions to minimize spread would be taken.</li></ul>
All Activities	<p>Public Safety:</p> <ul style="list-style-type: none"><li>• Appropriate signing or other cautionary measures would be implemented in conjunction with all management activities to ensure public safety. Implementation of these measures would be the responsibility of the person initiating the action (e.g., logging contractor, prescribed fire manager).</li></ul>
All Activities	<p>Range:</p> <ul style="list-style-type: none"><li>• Managers of vegetation treatment projects would consult with District range managers to ensure alteration of natural barriers does not allow livestock to circumvent fences.</li></ul>
All Activities	<p>Rare Plant Species:</p> <ul style="list-style-type: none"><li>• Refer to the botany design criteria shapefile for identified plant habitat and to the Biological Evaluation/Specialist Report for a verbal description of plant habitat.</li><li>• There is a 5,162 acre area that contains 1,040 acres of proposed timber harvest and prescribed fire treatments that have not been surveyed for rare plants. Potential plant habitat in this area will be surveyed prior to implementation and identified plant habitat and Sensitive plant and plant Species of Local Concern occurrences will be avoided during implementation. This area is included in the design criteria shapefile.</li><li>• Any plant habitat outside of treatment units would be avoided unless approved by a qualified botanist for entry.</li><li>• An R2 Sensitive plant or animal species or plant or animal Species of Local Concern located after contract or permit issuance will be appropriately managed by active coordination between permittee, contractor or purchaser, Forest Service line officer, project administrator, and biologist and/or botanist.</li></ul>
All Activities	<p>Recreation:</p> <ul style="list-style-type: none"><li>• Non-motorized trails would be shown as protected improvements on timber sale maps. Project administrators would ensure protection of trails during project implementation.</li></ul>

Applies To:	Measure
All Activities	<p>Revegetation:</p> <ul style="list-style-type: none"> <li>Native vegetation would be retained to the maximum extent possible during proposed activities.</li> <li>Disturbed soil would be revegetated in a manner that optimizes plant establishment for that specific site. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and placement of weed-free mulch as necessary. Revegetation would be initiated as soon as possible, generally not to exceed 6 months, after termination of ground-disturbing activities. All disturbed soils would be revegetated with native species when available using seed mixtures free of noxious weeds. On areas needing the immediate establishment of vegetation, non-native, non-aggressive annuals, non-aggressive perennials, or sterile perennials may be used until native perennials become established. These species can be used to prevent the spread of noxious weeds and prevent erosion. Only weed-free mulch would be used.</li> </ul>
All Activities	<p>Scenery:</p> <ul style="list-style-type: none"> <li>Activity slash would be reduced to natural levels within 300 feet of US Highway 14A and US Highway 385 unless not visible due to changes in topography. Slash would be treated within 1 year of harvest completion.</li> </ul>
All Activities	<p>Snags and Down Logs:</p> <ul style="list-style-type: none"> <li>Snags over 20 inches dbh and those with cavities would be cut only for safety reasons. Snags under 20 inches dbh would be cut only for safety reasons or when necessary for construction of roads, skid trails, firelines, and log landings.</li> <li>Retain at least 50 linear feet per acre of coarse woody debris with a minimum diameter of 10 inches in ponderosa pine stands and 100 linear feet per acre in white spruce stands to help retain moisture, trap soil movement, provide microsites for establishment of forbs, grasses, shrubs, and trees, and to provide habitat for wildlife.</li> <li>In vegetation treatment units, 1 pile of woody material per 2 acres would be left to create near-ground structure for small mammal species, except within 300 feet of buildings.</li> </ul>
All Activities	<p>Soil and Water:</p> <ul style="list-style-type: none"> <li>Some proposed activities would take place on soils identified as having a potential for severe erosion. The following special provisions, intended to minimize the amount of exposed bare soil, off-site transport, and soil displacement, would apply: (1) heavy equipment would avoid streams and swales except to cross at designated points, build crossings, or conduct restoration, unless protected by at least one foot of packed snow or two inches of frozen soil; (2) on slopes over 30 percent, harvesting and skidding methods that minimize the amount of soil displaced into piles or windrows would be used in order to leave soil intact and in place; (3) prescribed burns on slopes over 30 percent would be conducted when soil, duff, and large fuels are sufficiently moist to retain beneficial duff as ground cover for prevention of erosion.</li> </ul>

Applies To:	Measure
All Activities	<p>Wildlife:</p> <ul style="list-style-type: none"> <li>Any newly discovered raptor nests, red-bellied snake hibernacula or potentially sensitive bat roosts (i.e., snags/rock formations observed being used by bats, or newly discovered mines and caves) would be evaluated by a district wildlife biologist prior to implementation to determine if special requirements are warranted to protect site integrity. These resources will be protected in accordance with Forest Plan Standards.</li> <li>Tree marking will not occur from April 1 through August 15 within 1/8 mile of active goshawk nests to assure that goshawks do not abandon nests. From April 1 through August 15, if crews are being aggressively watched or attacked by goshawks during marking activities they will immediately abandon all marking efforts within 1/2 mile of the active goshawk nest.</li> <li>To minimize disturbance to nesting goshawks and osprey a timing restriction will apply from April 1 through August 15 within 1/2 mile of active nests by minimizing human-caused noise and disruption beyond that occurring at the time of nest initiation. The following activities will not occur during the timing restriction: fuel reduction activities, cutting, skidding, yarding, decking, hauling, road construction and other activities that may disturb nesting birds. Exceptions might be: hauling within 1/2 mile of active nest sites during the nesting season if it is reasonable to assume that birds in the area are habituated to this type of disturbance or surveys indicate that raptors are not nesting in the area (consult with a district wildlife biologist to determine if an exception is biologically justifiable).</li> <li>Incorporate Watershed Influence Zone (WIZ) and Best Management Practices (BMPs) for the protection of aquatic habitat for dippers, northern leopard frogs, mountain suckers and other aquatic wildlife species.</li> <li>Avoid creating barriers (e.g. new open roads) between red-bellied snake hibernacula and riparian areas or wetlands. There are currently no known hibernacula in the planning area. This design criterion will apply to any newly discovered hibernacula.</li> </ul>
All Activities	<p>Travel Management:</p> <ul style="list-style-type: none"> <li>While any projects resulting from this analysis are taking place, all gates that would normally be closed will remain closed except for administrative purposes.</li> </ul>
Timber Harvest	<p>Harvest:</p> <ul style="list-style-type: none"> <li>Existing pine regeneration would generally be protected in stands proposed for overstory removal harvest. Provisions related to felling, bucking, and whole tree yarding would be included in the timber sale contract. Log length yarding is the preferred method of timber removal. Skid trails within these stands would be approved by the sale administrator before commencement of logging. Landing locations would, where feasible, take advantage of existing openings or areas with no regeneration.</li> <li>To increase the likelihood of successful conifer regeneration, stands proposed for seed cuts would be logged in the summer or early fall where feasible to maximize the site scarification provided by the skidding operation, provided there are no concerns related to riparian areas, noxious weeds, or sensitive plants. Cutting would be done in such a way that areas would be restocked with trees within five years after harvest.</li> <li>Where stand variation dictates an alternative treatment to the majority treatment, this variation shall be accommodated. For example, a quarter acre pocket of aspen within a commercial thin stand of ponderosa pine shall be cleared of conifers within and up to 30 feet from the edge of the pocket.</li> </ul>
Timber Harvest	<p>Road Restrictions:</p> <ul style="list-style-type: none"> <li>Timber sale units would be laid out to facilitate existing road restrictions (for example, trees around gates and other barriers would be left uncut to maintain obstructions and discourage driving around the gate or barrier).</li> </ul>

Applies To:	Measure
Timber Harvest	<p>Scenery:</p> <ul style="list-style-type: none"> <li>• Layout and marking of timber sale units would comply with forest-wide marking guides in effect at the time of implementation.</li> <li>• Where treatments would be visible from Interstate 90, edges of treatment units would be feathered into untreated stands to mimic natural forest/opening edge typically found in this landscape. Affected areas are mapped in the project file.</li> <li>• Where possible, treatments would be designed to reduce the chance of wind damage to residual trees. This may include retaining higher density of mature trees on exposed ridges, lee slopes, and other areas prone to high winds and heavy snow accumulation.</li> <li>• Where possible, log decks would be located at least 300 feet from US Highways 14A and 385.</li> <li>• To reduce effects of continuously even tree spacing on wildlife and scenery, commercial thin treatments would emphasize tree health and crown size over spacing. Residual trees in overstory removal and seed cut units would be variably spaced.</li> <li>• Skyline logging corridors would be as narrow as possible to minimize visual effects of any soil displacement.</li> <li>• Where existing conditions allow, treatments in forested areas adjacent to other ownership would blend into adjacent conditions rather than creating strong lines. A horizontal transition zone of 1.5 times the height of the overstory is suggested.</li> </ul>
Timber Harvest	<p>Range:</p> <ul style="list-style-type: none"> <li>• All pasture gates would be identified on Timber Sale Area maps and kept closed during the grazing season (June through October). Maintained fences would be protected during logging operations.</li> <li>• If log hauling or movement of heavy equipment related to the proposed timber harvest causes damage to cattleguards, the timber purchaser would be responsible for repair.</li> </ul>
Timber Harvest	<p>Rare Plant Species:</p> <ul style="list-style-type: none"> <li>• Sensitive plant and plant Species of Local Concern occurrences would be avoided during all proposed timber harvest activities. Known areas are identified in the design criteria shapefile.</li> <li>• Plant habitat would be excluded from mechanical treatment areas. Known plant habitat is identified in the design criteria shapefile.</li> <li>• Any skid trails, temporary roads, landings, or other disturbances associated with logging activities in plant habitat would be designated in consultation with a qualified botanist. These areas are included in the design criteria shapefile.</li> <li>• Any plant habitat outside of treatment units would be avoided unless approved by a qualified botanist for entry. These areas are included in the design criteria shapefile.</li> </ul>
Timber Harvest	<p>Recreation:</p> <ul style="list-style-type: none"> <li>• Snowmobile trails would be shown as improvements on timber sale area maps and protected during harvest operations. An evaluation of the potential for conflicts between logging and trail use would take place at the time of timber sale appraisal and contract preparation. If conflicts appear likely between use of the snowmobile trails and specific logging units or haul routes, logging would be restricted between December 1 and March 31 unless a logical and desirable alternative snowmobile route is identified. Only those units and/or roads in conflict would be restricted so that logging operations could proceed in the remainder of the sale area.</li> <li>• Winter operations of timber sale units that necessitate skidding across a snowmobile trail but do not otherwise affect the trail may be allowed. Determination would be made on a case-by-case basis, with crossings permitted only at locations approved by the sale administrator and with proper cautionary signing installed by the timber contractor.</li> </ul>

Applies To:	Measure
Timber Harvest	<p>Soil and Water:</p> <ul style="list-style-type: none"> <li>• In stands where Lakota or Citadel soils are present and slopes exceed 30%, ensure that an overstory density of at least 60 BA remains following timber harvest.</li> <li>• In stands where slopes exceed 55%, ensure that an overstory density of at least 60 BA remains following timber harvest.</li> <li>• Slash in and install waterbars, where necessary, on skid trails following harvest activities.</li> <li>• When logging in previously disturbed stands, use existing skid trails and landings whenever possible.</li> <li>• Soils that have the potential of soil organic matter content at less than two percent would require that conventional harvest systems that retain the slash would be used within the specified soil map units; or if whole tree harvesting is used, fine slash (less than 3 inches in diameter) would be returned to the site if quantities identified in Forest Plan Standard 1102/Guideline (a) are not met.</li> </ul>
Timber Harvest	<p>Wildlife:</p> <ul style="list-style-type: none"> <li>• No treatments will be conducted within 500 feet of adit portal or shaft openings of mines or caves to maintain microclimate of bat hibernacula or nurseries, unless it is determined through bat surveys that the site is not bat roost habitat. Bat surveyors and bat survey protocols must be pre-approved by the district wildlife biologist and surveys must be conducted prior to implementation to determine if the site needs protection, and to what extent, or else the 500 foot no treatment zone will apply around the opening. Known mine site locations are documented in the project file.</li> <li>• Known snail sites with R2 Sensitive Species or Species of Local Concern will be avoided (i.e, no vegetation treatments, no heavy equipment use, and no skid trails, landings, temporary roads or any other activity that may compact soils or alter ground cover, moisture regimes or litter composition). Known site locations are documented in the project file and shown on timber sale maps.</li> <li>• Disturbance of newly discovered colonies of land snails would be avoided until it is evaluated by a district wildlife biologist in order to determine if R2 Sensitive Species or Species of Local Concern are present. The district wildlife biologist would determine appropriate buffer areas (no treatment zones) around newly discovered colonies based on site-specific conditions. Avoidance zones or mitigation measures would be determined on a case-by-case basis.</li> <li>• Fifty percent ponderosa pine canopy cover or more will be maintained in areas between spruce stands that have been identified as connective corridors for martens. Specific site locations are documented in the project file.</li> <li>• Whenever possible, skid trails (or other surface disturbing activities) will be placed directly adjacent to aspen stands to promote expansion of aspen clones which are likely to benefit from openings and ground disturbance.</li> </ul>
Timber Harvest	<p>Aspen Stands (Project-wide except for within Spearfish Canyon [MA 4.2A]):</p> <ul style="list-style-type: none"> <li>• Where Hardwood Enhancement Sites are adjacent to commercial treatment units, clear cut all conifers within one tree length (50-70') of aspen stand to allow for expansion of aspen into opening.</li> <li>• Cut and hinge all conifers within Non-commercial Hardwood Enhancement Units to remove encroaching ponderosa pine and spruce. Hinging conifers is intended to provide protection to aspen suckers and minimize impacts of browsing. Lop and scatter, or pile and burn, all conifers too small to hinge.</li> <li>• Whenever possible, skid trails (or other surface disturbing activities) will be placed directly adjacent to aspen stands (but not birch stands) to promote expansion of aspen clones which are likely to benefit from openings and ground disturbance.</li> <li>• Conserve all live hardwoods with wildlife cavities and all snags; except for those that are considered a safety hazard.</li> </ul>

Applies To:	Measure
Timber Harvest	<p>Spruce Habitat:</p> <ul style="list-style-type: none"> <li>Commercial and non-commercial treatments of ponderosa pine in spruce dominated stands will not occur except within 200 feet of buildings or where spruce is encroaching into hardwoods so long as other identified design criteria does not apply in these areas.</li> <li>High quality spruce habitat and spruce corridors for martens have been identified and will not be commercially treated. Specific site locations are documented in the project file.</li> </ul>
Prescribed Fire	<p>Burn Plan:</p> <ul style="list-style-type: none"> <li>Prescribed burning would be implemented only under conditions defined in a prescribed burn plan.</li> <li>The District Silviculturist will assist with the preparation of or review the final prescribed burn plan.</li> </ul>
Prescribed Fire	<p>Heritage Resources:</p> <ul style="list-style-type: none"> <li>Heritage resource inventory would be completed in proposed burn units prior to implementation.</li> </ul>
Prescribed Fire	<p>Improvements:</p> <ul style="list-style-type: none"> <li>Utility lines and any other improvements within the burn unit would be protected during prescribed burns.</li> </ul>
Prescribed Fire	<p>Rare Plant Species:</p> <ul style="list-style-type: none"> <li>Plant habitat within prescribed burn units would not be directly ignited. These areas are included in the design criteria shapefile.</li> <li>Control lines that disturb soil, i.e. hand lines or dozer lines, would not be located in plant habitat, unless needed to ensure safety. These areas are included in the design criteria shapefile.</li> </ul>
Prescribed Fire	<p>Soil and Water:</p> <ul style="list-style-type: none"> <li>Prescribed burns in some sites would take place all or partly on soils with severe erosion hazard. These burns would take place only when burn severity could be kept low.</li> <li>Small wetlands located in or immediately adjacent to any burn units would be excluded from areas to be burned and protected from disturbance.</li> </ul>
Prescribed Fire	<p>Scenery:</p> <ul style="list-style-type: none"> <li>Where possible, prescribed burns adjacent to US Highways 14A and 385 would be burned so that overstory trees visible from the road show as little scorch as possible.</li> </ul>
Prescribed Fire	<p>Implementation:</p> <ul style="list-style-type: none"> <li>During prescribed burns, the district silviculturist will establish a limit for overstory mortality, based on site conditions.</li> </ul>

Applies To:	Measure
Prescribed Fire	<p>Wildlife:</p> <ul style="list-style-type: none"> <li>In any given year, conduct prescribed burns on no more than 60% of a contiguous meadow (that is <math>\geq 20</math> acres in size) to minimize impacts of prescribed fire on butterflies and ground nesting birds. Timing restriction would apply to meadows from May 15 to August 15 or prior to spring green up, to minimize impacts to ground nesting birds. Fall burns are preferred.</li> <li>Prescribed burns within <math>\frac{1}{2}</math> mile of historic goshawk nests would be coordinated with district wildlife biologist. Timing restriction would apply from April 1 through August 15 if the nests are active.</li> <li>All documented land snail colonies with R2 Sensitive Species or Species of Local Concern that are in prescribed burn units would be protected by burning when snails are hibernating (i.e., when average daytime temperatures are <math>\leq 50</math> degree Fahrenheit) or else these colonies will be avoided. Specific site locations are documented in the project file.</li> <li>No fire lines or direct ignition of fire will occur on known snail colonies any time of the year. Specific site locations are documented in the project file.</li> <li>No direct ignition will occur in spruce stands.</li> <li>During prescribed burning, protect existing guzzlers through what ever means the burn boss deems appropriate (e.g., foam, black lining, wrapping, etc.), based on site conditions. Specific site locations are documented in the project file.</li> <li>If Atlantis fritillary or regal fritillary butterflies occur in meadows that are with in burn units, redesign the project to conserve important habitat components of known sightings (survey for butterflies as appropriate). No known occurrences of either species exist in proposed burn blocks. Check with the district biologist prior to burning to determine if new information indicates their presence.</li> <li>Prescribed burning in areas with caves or mines would be coordinated with district wildlife biologist. Impacts to bat hibernacula would be avoided by not burning during winter months (Oct 15 to May 15) and by black lining mine or cave openings prior to ignition of the main unit. There are currently no known mines or caves in proposed burn blocks. This design criterion will apply to any newly discovered hibernacula.</li> </ul>
Prescribed Fire	<p>Range:</p> <ul style="list-style-type: none"> <li>To avoid conflicts with grazing, and to ensure that prescribed fire mitigation is implemented, prescribed fire projects will be coordinated in advance with the range management specialist.</li> </ul>
Prescribed Fire	<p>Recreation:</p> <ul style="list-style-type: none"> <li>Personnel from the South Dakota Department of Game, Fish and Parks will be notified prior to the initiation of prescribed burns if the burn unit includes or is adjacent to a designated snowmobile trail so that trail markers may be removed or protected.</li> <li>Slash piles immediately adjacent to designated snowmobile or cross-country ski trails will not be burned between December 1 and March 31 to prevent melting of the snow on the trail.</li> </ul>
Transportation System	<p>Dust Control:</p> <ul style="list-style-type: none"> <li>Dust control, if necessary, may be done with water, magnesium chloride, calcium chloride, or equivalent.</li> </ul>
Transportation System	<p>Noxious Weeds:</p> <ul style="list-style-type: none"> <li>District staff responsible for the noxious weed program would, in coordination with the project engineer, inspect gravel pits for noxious weed infestation before transport and use of gravel and other material. Infestations would be treated to prevent spread.</li> <li>District staff responsible for the noxious weed program would inspect stockpiled gravel annually for weed infestation in coordination with the project engineer.</li> </ul>



Applies To:	Measure
Transportation System	<p>Revegetation:</p> <ul style="list-style-type: none"> <li>Timber sale roads would be seeded after construction but before timber harvest if any part of the gap between construction and harvest would occur between April and October. This may be accomplished under the road contract. If necessary, seeding would again occur after use of the road is complete. Seeding may be delayed until after completion of harvest if the gap between construction and harvest would be of short duration and hydrology, soils, engineering, and noxious weed specialists determine after field review that a delay would be acceptable.</li> </ul>
Transportation System	<p>Soil and Water:</p> <ul style="list-style-type: none"> <li>New road construction will be examined during layout for potential soil movement to ensure that mass movement is not likely to occur.</li> <li>New road construction should be designed to limit cut and fill slopes where possible, particularly when located above steep slopes.</li> <li>Construction of landings, roads, and tractor and skid trails would be avoided within 100 feet (or a distance equal to the mean height of mature dominant late-seral vegetation, whichever is more) of perennial seeps, springs, and wetlands. If this is not possible, crossings would be constructed and restored to prevent headcutting, gullying, erosion, and sediment transport to ephemeral or perennial channels.</li> <li>Creation of large water collection points, such as road ditches or excessively large water bars, would be avoided, particularly up-gradient of existing rotational slumps and landslides. A greater frequency of smaller water bars than that recommended in FSH 2509.25 may be used. Temporary road cuts exceeding two feet would be avoided. If this is infeasible because of steep slopes, temporary roads would be recontoured.</li> <li>Where feasible, existing haul roads would be reconstructed with rolling grades instead of ditches and culverts.</li> <li>Water bars and sediment barriers would be placed 10 to 20 feet below water bar outlets and culvert outlets on skid trails steeper than 15 percent.</li> <li>Engineering staff would consult with a forest hydrologist and fisheries biologist on design of stream crossings. Fill slopes would be protected with riprap, gabions, prompt seeding, or other measures approved by the hydrologist, fisheries biologist, and soil scientist. Placement of structures would comply with federal and state laws regarding construction in and near waterways, including placement of fill and measures to control sedimentation.</li> </ul>
Transportation System	<p>Travel Management:</p> <ul style="list-style-type: none"> <li>All newly constructed roads and skid trails would be closed following construction until needed for timber sale or related activities and closed again after use. Roads needed for timber sale or related activities but normally closed to motorized vehicles would also be closed when not in use.</li> <li>All newly constructed roads will be closed with appropriate methods, which may include: locked gates, dirt berms, boulders, downed trees, fences, partial obliteration and recontouring. This will be accomplished as a KV project.</li> <li>Where new roads are constructed through existing range allotment fences to access timber sale units, temporary cattle guards will be installed at the crossing point. Immediately following completion of the timber sale and all related activities, the cattle guard would be removed and the fence returned to its original condition. Cattle guards would not be replaced with any form of gate.</li> <li>Avoid or protect utility infrastructure during construction and decommission of roads.</li> </ul>
Transportation System	<p>Rare Plant Species:</p> <ul style="list-style-type: none"> <li>A botanist will work with the road engineer to determine the best placement of the proposed new road construction that will potentially cross plant habitat. These areas are included in the design criteria shapefile.</li> </ul>

Applies To:	Measure
Transportation System	<p data-bbox="456 254 548 279">Wildlife:</p> <ul data-bbox="456 289 1414 598" style="list-style-type: none"><li data-bbox="456 289 1414 436">• Maintenance of existing roads in areas that pass through known snail colonies will be limited to the clearing limits (i.e., roads may be maintained to standard). If needed improvements or realignment of those areas go beyond the existing clearing limits, review and input by the district wildlife biologist would be required to ensure that snail colonies would not be impacted.</li><li data-bbox="456 443 1414 531">• Avoid constructing new roads through snail colonies. Where data suggests an overlap between new roads and known snail colonies, a wildlife biologist and the engineer will together determine if there are any feasible alternate road locations.</li><li data-bbox="456 537 1414 598">• The presence of snails in any area not previously identified will be brought to the attention of the wildlife biologist before maintenance or construction continues.</li></ul>

## DESIGN CRITERIA APPLICABLE TO ACTIVITIES UNDER ALTERNATIVE C

All design criteria applicable to activities under Alternative B also apply to the activities proposed under Alternative C with the addition of the following:

Applies To:	Measure
Fuel Reduction Near Private Structures	<p>Wildlife:</p> <ul style="list-style-type: none"> <li>Fuel treatments may occur up to 300' from structures. Within Spearfish Canyon, fuel treatments will be conducted to thin conifers less than 9" dbh, retaining spacing on trees at approximately 16'. This design criteria should not create conditions conducive to promoting wind throw in spruce habitat and will attempt to maintain the microhabitat of the forest floor. Under this alternative, fuels may be piled and burned, or chipped, depending on site conditions.</li> <li>In Spearfish Canyon, mechanical equipment (e.g., chippers, ATVs, vehicles, etc.) will be restricted to paved/gravel surfaces or frozen ground during fuels reduction projects which will minimize impacts to sensitive species.</li> <li>In Spearfish Canyon, if chipping is conducted, chips must be removed from NFS land to retain ground litter composition for sensitive species.</li> <li>In Spearfish Canyon and on known snail sites across the project area, piles on NFS land will be burned when snails are hibernating (i.e., when average daytime temperatures are <math>\leq 50</math> degree Fahrenheit).</li> <li>In Spearfish Canyon, to protect hibernating bats from smoke generated by pile burning, piles will be burned only when smoke inversions are not anticipated to occur. There are currently no known bat hibernacula or roosts in Spearfish Canyon.</li> <li>Conserve all live hardwoods with wildlife cavities and all snags; except for those that are considered a safety hazard.</li> </ul>
Fuel Reduction Near Private Structures	<p>Soils:</p> <ul style="list-style-type: none"> <li>In Spearfish Canyon, Fuel reduction treatments within 300 feet of private structures may only be conducted on slopes of less than 30%.</li> </ul>
Fuel Reduction Near Private Structures	<p>Timber Harvest:</p> <ul style="list-style-type: none"> <li>No trees greater than 9 inches dbh, including snags, may be harvested. If hazard trees greater than 9 inches dbh are identified, permission to remove them must be obtained from the Forest Service.</li> </ul>
Fuel Reduction Near Private Structures	<p>Noxious Weeds:</p> <ul style="list-style-type: none"> <li>Where disturbance occurs that exposes bare mineral soil as a result of fuel reduction activities, the area must be reseeded with a native mix of weed-free seed.</li> </ul>
Fuel Reduction Near Private Structures	<p>Burn Piles:</p> <ul style="list-style-type: none"> <li>Where material is cut and piled, piles will be located on private land and burned by private landowners whenever feasible.</li> <li>If piles are placed on NFS land, piles must meet Forest Service specifications and GPS locations of piles must be provided to the District. Forest Service fire personnel will burn all piles located on NFS land.</li> </ul>

Applies To:	Measure
Fuel Reduction Near Private Structures	<p>Rare Plant Species:</p> <ul style="list-style-type: none"><li>• Piles will not be placed within 30 feet of known Sensitive plant or plant Species of Local Concern sites. During implementation, a botanist will be consulted.</li><li>• A 30 ft. no treatment buffer would be placed around known sites of Sensitive plants and plant Species of Concern. During implementation, a botanist will be consulted.</li></ul>

## **MONITORING FOR ALL ACTION ALTERNATIVES**

The Northern Hills Ranger District would monitor implementation of the selected alternative. The timber sale administrator or other contract administrators would complete some of the project implementation monitoring. Other resource specialists would be involved in monitoring of specific mitigation measures relating to their particular resource area. Specific monitoring requirements are listed below.

- Prescribed fire managers would establish photo points in prescribed burn units to compare pre- and post-treatment conditions and document fire behavior during implementation.
- Fuels staff would evaluate effectiveness of fuel treatments in reducing fuel loading.
- Fire managers would evaluate burned areas to establish a timeline for maintenance burning.
- Project managers would monitor revegetation of disturbed and burned areas to determine need for additional measures and noxious weed control.
- Engineering and hydrology/soils specialists would monitor effectiveness of erosion control measures (seeding, water bars, etc.) one and three years following installation.
- Hydrology/soils staff would monitor soil compaction at a sample of timber sale landings and harvest units.
- Timber sale administrators and hydrology/soils specialists would monitor application and effectiveness of Best Management Practices.
- The district planning team would monitor timber sale layout to evaluate project implementation and assumptions used in the planning process. The district planning team would monitor timber sale implementation following sale closure.